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Universitat Politècnica de Catalunya (UPC)
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Research Interests

Wireless LANs, wireless ad-hoc networks, QoS in wireless ad-hoc networks, wireless mesh networks, TCP/IP, performance evaluation, queueing networks, C++ programming and simulation of computer networks.

Research Group

My research activities are inside the "Computer Networking Group", created by Prof. Olga Casals. at Computer Architecture Department, UPC, in 1988.

<http://research.ac.upc.edu/CompNet>

Education

January 2000

Ph.D., Telecommunications Engineering
Universitat Politècnica de Catalunya (UPC)
Thesis: *Traffic Management of the ABR Service Category in ATM Networks*
Adviser: Prof. Olga Casals-Torres
Committee: Dr. José María Barceló-Ordinas (Universitat Politècnica de Catalunya, Spain), Prof. Vicente Casares-Giner (Universitat Politècnica de València, Spain), Prof. Ulf Körner (Lund University, Sweden), Prof. Ramon Puigjaner Trepal (Universitat de les Illes Balears, Spain), Prof. Ioannis Stavrakakis (University of Athens, Greece).

December 1993

Telecommunication Engineering
Escola Tècnica Superior d'Enginyers de Telecomunicació de Barcelona (ETSETB)
Universitat Politècnica de Catalunya (UPC), Barcelona, Spain and
Politecnico di Torino, Torino, Italy (Erasmus grant)
Project Degree: *Simulation of the Radio-Channel Lognormal-Fading*

December 1989

Electrical Technical-Engineering
Escola Universitària d'Enginyeria Tècnica Industrial de Terrassa (EUETIT)
Universitat Politècnica de Catalunya (UPC), Terrassa, Spain
Project Degree: *Simulation of a DC Motor Ativation*

Employment

3/1994–5/2001

Assistant Professor
Universitat Politècnica de Catalunya (UPC)
Departament d'Arquitectura de Computadors

5/2001–now

Associate Professor
Universitat Politècnica de Catalunya (UPC)
Departament d'Arquitectura de Computadors

Teaching

PhD Courses

- Mathematical Concepts Applied to Computer Networks.
<http://docencia.ac.upc.edu/master/CMARC>
- Wireless LANs, Ad-hoc and Sensor Networks.
<http://docencia.ac.upc.edu/master/RALIAS>

Postgraduate Courses

- Comparative Network Design

Undergraduate Courses

- Xarxes de Computadors - Computer Networks.
<http://docencia.ac.upc.edu/FIB/XC>

Other

- Cisco Networking Academy Program (CCNA) Instructor.

Educational Publications

- [1] Llorenç Cerdà-Alabern, José-M. Barceló-Ordinas, and Jorge García-Vidal. WEBTEST: Herramienta web usada en la evaluación de prácticas de laboratorio. In *Proc. of 4th Congreso Internacional "Docència Universitària i Innovació" (CIDUI)*. Barcelona, Spain, July 5–7, 2006. ISBN 84-8458-240-X. URL <http://cidui.upc.edu/>.
- [2] Llorenç Cerdà. *Xarxes de Computadors. Conceptes bàsics*. Edicions UPC, Barcelona, Spain, 2006. ISBN 84-8301-897-2. In Catalan.

Organization of Events

- June 7-9, 2006 **Third Euro-NGI Workshop on Wireless and Mobility. Sitges, Spain.**
<http://recerca.ac.upc.edu/eurongi06>
- February 24-27, 2004 **The Fifth European Wireless Conference Mobile and Wireless Systems beyond 3G. Barcelona, Spain.**
<http://recerca.ac.upc.edu/EW2004>
- April 25-27, 2001 **ITC Specialists Seminar on Access Networks and Systems. Girona, Spain.**
<http://recerca.ac.upc.edu/ITC-SS-01>

Research Publications

Journal Papers

- [1] Rafael Guimarães, Llorenç Cerdà, José-M. Barceló-Ordinas, Jorge García-Vidal, Michael Voorhaen, and Chris Blondia. BR-MANET: Bandwidth Reservation on Multirate Mobile Ad-hoc Networks. *Submitted to Ad-hoc Networks*, 2007.
- [2] Jorge García-Vidal, Maribel March, Llorenç Cerdà, Jesús Corbal, and Mateo Valero. A DRAM/SRAM Memory Scheme for Fast Packet Buffers. *IEEE Transactions on Computers*, 55(5):588–602, May 2006. ISSN 0018-9340.
- [3] Chris Blondia, Olga Casals, Llorenç Cerdà, Nik Van den Wijngaert, and Gert Willems. Performance Evaluation of Layer 3 Low Latency Handoff Mechanisms. *Mobile Networks and Applications*, 9(6):633–645, December 2004. ISSN 1383-469X.
- [4] Peter de Cleyn, Nick Van den Wijngaert, Llorenç Cerdà, and Chris Blondia. A smooth handoff scheme using IEEE 802.11 triggers - design and implementation. *Computer Networks*, 45(3):345–361, June 2004. ISSN 1389-1286.

- [5] Llorenç Cerdà, Favio Vena, and Olga Casals. Study of the TCP Dynamics over Wireless Networks with Micromobility Support Using the ns Simulator. *Wireless Networks*, 10(1):17–27, January 2004. ISBN 1022-0038.
- [6] Llorenç Cerdà and Olga Casals. Charging of the ABR Service in ATM Networks: A numerical Example. *looking forward, a Supplement to Computer*, 1998. ISSN 0018-9162.

Book Chapters

- [1] Rafael Guimarães and Llorenç Cerdà. *Wireless Systems and Mobility in Next Generation Internet: Third International Workshop of the EURO-NGI Network of Excellence*, volume 4396 of *Lecture Notes in Computer Science (LNCS)*, chapter Adaptive QoS Reservation Scheme for Ad-hoc Networks, pages 102–112. Springer-Verlag, March 2007. ISBN 978-3-540-70968-8. ISSN 0302-9743.
- [2] Llorenç Cerdà, Michael Voorhaen, Rafael Guimarães, José-M. Barceló, Jorge García, and Chris Blondia. *Wireless Systems and Mobility in Next Generation Internet*, volume 3427 of *Lecture Notes in Computer Science (LNCS)*, chapter A Reservation Scheme Satisfying Bandwidth QoS Constraints for Ad-hoc Networks, pages 176–188. Springer-Verlag, 2005. ISBN 3-540-25329-7. ISSN 0302-9743.
- [3] S. Aalto, H. van den Berg, R. Boucherie, Llorenç Cerdà, S. Imre, J. Kilpi, M. Meo, M. Mohorcic, and Dirk Staehle. *COST-279 Midterm Report - Analysis and Design of Advanced Multiservice Networks Supporting Mobility, Multimedia and Internetworking*, chapter Wireless Networks, pages 99–119. ARACNE, Roma, Italy, January 2004. ISBN 88-7999-635-5.
- [4] Chris Blondia, Nick Van den Wijngaert, Gert Willems, Olga Casals, Llorenç Cerdà, M. Bagnulo, and I. Soto. *Quality of Future Internet Services (COST Action 263 Final Report)*, volume 2856 of *Lecture Notes in Computer Science (LNCS)*, chapter Mobile Networking, pages 180–207. Springer-Verlag, July 2003. ISBN 3-540-20193-9. ISSN 0302-9743.
- [5] C. Belo, Chris Blondia, W. Burakowski, Olga Casals, Llorenç Cerdà, S. Peeters, M.F. Sánchez, and H. van den Berg. *COST-257 Final Report - Impacts of New Services on the Architecture and Performance of Broadband Networks*, chapter Network Control, pages 5–30. compuTEAM, Würzburg, Germany, September 2000. ISBN 3-930111-10-1.
- [6] Llorenç Cerdà and Olga Casals. *ATM Networks Performance Modelling and Analysis*, volume 2, chapter A Study of the Fairness of the Fast Reservation Protocol, pages 400–413. Chapman & Hall, London, 1996. ISBN 0-412-79200-1.

Conference Papers

- [1] Rafael Guimarães and Llorenç Cerdà. Qualidade de serviço em redes ad-hoc através de reserva distribuída de recursos. In *Proc. of XII Seminario Apec*, pages 325–334. Barcelona, Spain, May 17–18, 2007. ISBN 978-84-611-6984-9. URL http://www.apecbcn.org/Seminario_2007.htm.
- [2] Rafael Guimarães and Llorenç Cerdà. Improving reactive routing on wireless multirate ad-hoc networks. In *Proc. of 13th European Wireless 2007 (EW2007)*. Paris, France, April 1–4, 2007. ISBN 2-912328-41-1. URL <http://www.ew2007.org>.
- [3] Rubén González and Llorenç Cerdà. DRAP: Dual-Queue Rate-Controlled Access Point for Multimedia Communications in WLAN Hotspots. In *Proc. of the Fifth IASTED International Conference on Communication Systems and Networks (CSN)*, pages 159–164. Palma de Mallorca, Spain, August 28–30, 2006. ISBN 0-88986-606-6.
- [4] Rafael Paoliello Guimarães and Llorenç Cerdà. Adaptive QoS Reservation Scheme for Ad-hoc Networks. In *Proc. of Third EuroNGI Workshop on Wireless and Mobility*. Siges, Spain, June 7–9, 2006. URL <http://research.ac.upc.edu/eurongi06>.

- [5] Rafael Guimarães and Llorenç Cerdà. Bandwidth Reservation On Wireless Networks with RTS/CTS Signalling. In *Proc. of 12th European Wireless 2006 (EW2006)*, pages 1–6. Athens, Greece, April 1–5, 2006. ISBN 978-3-8007-2961-6. URL <http://www.telecom.ntua.gr/EW2006>.
- [6] Rafael Guimarães, Julián Morillo, Llorenç Cerdà, José-M. Barceló, and Jorge García. Redes Inalámbricas de Emergencia Pública, el Proyecto WIDENS. In *Proc. of XV Jornadas Telecom I+D*, page . Barcelona, Bilbao, Madrid, Málaga, Valencia, Spain, November 2005. ISBN 84-689-3794-0. URL www.telecom-id.com.
- [7] Llorenç Cerdà, Rafael Guimarães, Julián Morillo, José-M. Barceló, Jorge García, Ana Perez-Neira, Marc Realp, Michael Voorhaen, Chris Blondia, R. Knopp, and N. Nikaein. QoS Management in WIDENS Terminodes. In *TRENDS IN RADIO RESOURCE MANAGEMENT (2nd Edition)*. Barcelona, Spain, November 2005. Workshop organized inside the EVEREST European Project, IST-2002-001858.
- [8] Rubén González and Llorenç Cerdà. A QoS mechanism for videoconferencing support in 802.11 Hotspots. In *HET-NETS'05*, pages P22/1–P22/10. Ilkley, UK, July 2005. ISBN 0-9550624-0-3.
- [9] Llorenç Cerdà, Michael Voorhaen, Rafael Guimarães, José-M. Barceló, Jorge García, Julián Morillo, and Chris Blondia. A Reservation Scheme Satisfying Bandwidth QoS Constraints for Multirate Ad-hoc Networks. In *14th IST Mobile & Wireless Communications Summit*. Dresden, Germany, June 1–5, 2005.
- [10] Hervé Aiache, Vania Conan, Gregoire Guibé, Jeremy Leguay, Christophe Le Martretch, José-M. Barceló, Llorenç Cerdà, Jorge García, Raymond Knopp, Navid Nikaein, Xavier González, A. Zeini, O. Apilo, Adrian Boukalov, Juoni Karvo, H. Koskinen, L.R. Bergonzi, Jesús-C. Diaz, J. Meessen, Chris Blondia, Peter de Cleyn, Erwin Van de Velde, and Michael Voorhaen. WIDENS: Wireless Ad-Hoc Network for Public Safety. In *14th IST Mobile & Wireless Communications Summit*. Dresden, Germany, June 1–5, 2005.
- [11] Rubén González and Llorenç Cerdà. Evaluación de las Funciones de Coordinación del Estándar IEEE 802.11 como Mecanismos para Calidad de Servicio. In *Proc. of XIV Jornadas Telecom I+D*. Barcelona, November 2004.
- [12] Jorge García, Maribel March, Llorenç Cerdà, Jesús Corbal, and Mateo Valero. On the Design of Hybrid DRAM/SRAM Memory Schemes for Fast Packet Buffers. In *Proc. of the IEEE High Performance Switching and Routing (HPSR)*, pages 15–19. Phoenix, Arizona, USA, April 2004. ISBN 0-7803-8375-3.
- [13] Maribel March, Jorge García, Llorenç Cerdà, Jesús Corbal, and Mateo Valero. Analysis of a High Performance DRAM/SRAM Memory Scheme for Fast Packet Buffers. In *Proc. of the First Workshop on Productivity and Performance in High-End Computing (WEPA-1), in conjunction with HPCA-10*. Madrid, Spain, February 2004.
- [14] Jorge García, Llorenç Cerdà, and Jesús Corbal. A Conflict-Free Memory Banking Architecture for Fast VOQ Packet Buffers. In *Proc. of the GLOBECOM'03*. San Francisco, USA, December 2003. ISBN 0-7803-7974-8 (Softbound), 0-7803-7975-6 (CDROM).
- [15] Jorge García, Jesús Corbal, Llorenç Cerdà, and Mateo Valero. Design and Implementation of High-Performance Memory Systems for Future Packet Buffers. In *Proc. of the 36th Annual International Symposium on Microarchitecture (MICRO'36)*, pages 373–384. San Diego, California, USA, December 2003. ISBN 0-7695-2043-X.
- [16] Chris Blondia, Olga Casals, Llorenç Cerdà, Nick Van den Wijngaert, Gert Willems, and Peter de Cleyn. Low Latency Handoff Mechanisms and Their Implementation in an IEEE 802.11 Network. In J. Charzinski, R. Lehnert, and P. Tran-Gia, editors, *Proc. of the 18th International Teletraffic Congress (ITC): "Providing Quality of Service in Heterogeneous Environments"*, volume 5b, pages 971–980. Elsevier, Berlin, September 2003. ISBN 0-444-51455-4.
- [17] Olga Casals, Llorenç Cerdà, Gert Willems, Chris Blondia, and Nick Van den Wijngaert. Performance evaluation of the Post-Registration method, a low latency handoff in MIPv4. In *Proc. of International Conference on Communications (ICC'03)*, pages 522–526. Anchorage Alaska, USA, May 2003. ISBN 0-7803-7802-4 (Softbound), 0-7803-7803-2 (CDROM).

- [18] Chris Blondia, Olga Casals, Llorenç Cerdà, Nick Van den Wijngaert, Gert Willems, and Peter de Cleyne. Performance Comparison of Low Latency Mobile IP Schemes. In *Proc. of WiOpt'03, Modeling and Optimization in Mobile, Ad Hoc and Wireless Networks*, pages 115–124. INRIA Sophia Antipolis, France, March 2003.
- [19] Chris Blondia, Olga Casals, Llorenç Cerdà, and G. Willems. Performance Analysis of a Forwarding Scheme for Handoff in HAWAII. In E. Gregori, M. Conti, A.T. Campbell, Guy Omidyar, and M. Zukerman, editors, *Proc. of Networking 2002*, volume 2345 of *Lecture Notes in Computer Science (LNCS)*, pages 503–514. Springer-Verlag, Pisa, Italy, May 2002. ISBN 3-540-43709-6. ISSN 0302-9743.
- [20] Favio Vena, Llorenç Cerdà, and Olga Casals. Study of the TCP Dynamics over Wireless Networks with Micromobility Support Using the ns Simulator. In *Proc. of European Wireless 2002*, pages 114–120. Florence, Italy, February 2002.
- [21] Llorenç Cerdà and Olga Casals. Study of the TCP Unfairness in a Wireless Environment. In *Proc. of IEEE International Conference on Telecommunications (ICT)*, volume 2, pages 281–295. Bucharest, Romania, June 2001. ISBN 973-99995-1-4.
- [22] Llorenç Cerdà, Beny van Houdt, Olga Casals, and Chris Blondia. Performance Evaluation of the Conformance Definition for the ABR Service in ATM Networks. In *Proc. of the Broadband Communications'99*, pages 209–222. Hong Kong, November 1999. ISBN 0-7923-8677-9.
- [23] Llorenç Cerdà and Olga Casals. Dimensioning of the CDVT in the Conformance Definition for the ABR Service in ATM Networks. In *Proc. of the 5th Open European Summer School, EUNICE'99*, pages 71–76. Barcelona, Spain, September 1999. ISBN 84-7653-717-4.
- [24] Olga Casals, Chris Blondia, Llorenç Cerdà, and Beny van Houdt. Congestion Control and Charging for the ABR Service Category in ATM Networks. In *Proc. of the SPIE Conf. on Performance and Control of Network Systems II*, volume 3530, pages 218–229. Boston, USA, November 1998. ISBN 0-8194-2991-0. ISSN 0227-786X.
- [25] Llorenç Cerdà and Olga Casals. Dynamic and Static Charging of the ABR Service in ATM Networks. In *Proc. of the GLOBECOM'98*. Sydney, Australia, November 1998. ISBN 0-7803-4987-3.
- [26] Llorenç Cerdà and Olga Casals. Experimental Analysis of an ER Switch for the ABR Service in ATM Networks. In *Proc. of the IV Jornadas de Informàtica*, pages 449–458. Gran Canaria, Spain, July 1998. ISBN 84-87526-61-6.
- [27] Llorenç Cerdà and Olga Casals. Effective Usage of the CCR in the ABR Service Management. In *Proc. of the International Conference for Computer Communications (ICCC)*, pages 199–206. Cannes, France, November 1997. ISBN 2-7261-1104-1.
- [28] Llorenç Cerdà and Olga Casals. Charging of the ABR Service in ATM Networks. In *Proc. of the 6th Open Workshop on High Speed Networks*, pages 111–118. University of Stuttgart, Stuttgart, Germany, October 1997.
- [29] Llorenç Cerdà and Olga Casals. Improvements and Performance Study of the Conformance Definition for the ABR Service in ATM Networks. In *Proc. of the ITC Specialists Seminar on Control in Communications*, pages 323–334. Lund, Sweden, September 1996. ISBN 91-630-4804-3.
- [30] Llorenç Cerdà, Jorge García, and Olga Casals. A Study of the Fairness of the Fast Reservation Protocol. In *Proc. of the IFIP TC6 3th Workshop on Performance Modelling and Evaluation of ATM Networks*. Ilkley, UK, July 1995.

EU Funded Research Projects

2004-2005 **Network of Excellence "EuroNGI" Design and Engineering of the Next Generation Internet** <http://www.eurongi.org>

2/2004-2/2006 **Wireless Deployable Network System (WIDENS).**

2000-2002 **MOBILE Extranet Based Integrated User (MOEBIUS).**

- 2000-2003 **COST 279: Analysis and Design of Advanced Multiservice Networks Supporting Mobility, Multimedia and Internetworking.**
- 2000-2003 **COST 263: Quality of Service in Internet.**
- 1996-2000 **COST 257: Impacts of New Services on the Architecture and the Performance of Broadband Networks.**
- 1995-1998 **Expert Platform for Engineering Research and Trials (EXPERT).**

Peer-to-Peer Research Projects

- 2001 **SouthWing: Distributed Speech Recognition (DSR) Architecture.**
- 2000 **Nokia: Test of a TCP/IP Software Implementation (TESI).**

Spanish Research Projects

- 2005-2006 **CICYT TEC2004-06437-C05-05.**
- 2001-2004 **CICYT TIC-2001-0956-C04-01. Quality of Service in Integrated Mobile IP Networks.**
- 2001-2003 **CIRIT 2001-SGR-00226. Disseny i avaluació de sistemes de banda ampla.**
- 1999-2002 **HERMES. Performance tool of a data base application.**
- 1999-2001 **CIRIT 1999-SGR-00029. Disseny i avaluació de sistemes integrats.**
- 1998-2001 **CICYT TIC-1998-1115-C02-01. Traffic Management in an ATM Wired/Wireless Networks.**
- 1996-1999 **CICYT TIC96-2042. EXPERT ATM Platform.**
- 1997-1999 **CIRIT 1997-SGR-00029. Grup de recerca consolidat.**
- 1995-1998 **CICYT TIC95-0982. ATM Services and ATM LANs.**
- 1994-1997 **CICYT TIC94-1512. Design and Evaluation of Broadband Networks.**
- 1995-1997 **CIRIT GRQ95-0464. Grup de recerca de qualitat.**

Other

- 2005 Positive evaluation of the research activity by the Spanish *Comisión Nacional Evaluadora de la Actividad Investigadora (sexenio)*, for the period 1998-2004.
- Peer reviewer of the performance Evaluation and Computer Networks journals and ITCSS, Networking, HPSR, PWC, QoS-IP, HETNETS, IPSI, ISCC, PIMRC, EW and EuroNGI conferences.